Dr. Athénaïs **Gautier**
Researcher in statistics

About me

As a researcher in statistics, my enthusiasm for quantifying uncertainty has grown through a journey exploring both academic research and practical applications.

My expertise in statistics and programming ideally places me to contribute to innovative projects at the intersection of data and strategic decision-making. My ability to communicate complex concepts in an accessible manner further enhances my role as a knowledge catalyst in interdisciplinary projects.

Contact information

✉ athena.gau@gmail.com

🖥 https://athenaisgautier.github.io/

Languages

🇫🇷 French - Mothertongue

🇬🇧 English - Bilingual

Research interests

Spatial statistics   Uncertainty Quantification

Gaussian Processes   Bayesian optimization

Inverse problems   Computer simulation models

Skills

Mathematics, Statistics, Machine Learning

Extensive foundational knowledge with the capability to simplify complex ideas for a broader audience.

Data Analysis

Very good mastery of R, comfortable with Python.

Programming

Proficient in *R* (package development on CRAN)
Proficient in *C++* (coding geostat. simulations)
Comfortable with *Python*.

Data Visualization

Mastery of *ggplot2* package in *R*. Skilled in identifying and meeting visualization needs.

Presenting Results

Through academic publications, written reports in LaTeX, RMarkdown, and Jupyter Notebook, and oral presentations.

💼 WORK EXPERIENCE

Sept. 2023 - Present

Postdoctoral Researcher   📍 Montreal, QC, Canada
McGill University
Research in Geostatistics:
◇ Probabilistic modeling of mineral resources.
◇ Integration of expert knowledge and drilling data.
◇ Development of codes in C++.
◇ Applications to real data from the mining sector.

Nov. 2018 - June 2023

Doctoral Researcher   📍 Bern, Switzerland
Institute of Statistics, University of Bern
Until May 2020, the affiliation was shared with Idiap Research Institute (Martigny, Switzerland).

Research in Statistics
◇ Non-parametric estimation of conditional probabilities.
◇ Modeling under uncertainty of complex systems.
◇ Solving stochastic inverse problems.
◇ Guiding data acquisition for inversion and Bayesian Optimisation.
◇ Interdisciplinary collaborations in natural sciences.
◇ Programming in R, CRAN package development.

Senior Consultant at the Institute of Statistics *(2021 - 2023)*
◇ Statistical analyses for companies and academics.
◇ Knowledge transfer to non-statisticians.
◇ Work on financial, social, biomedical data.

Teaching in English. *(2019 - 2023)*
◇ Statistics courses for climate sciences.
◇ Design and conduct of exercise sessions.
◇ Levels concerned: Bachelor to PhD.
◇ Co-supervision of a Master's thesis on Gaussian process regression applied to molecules.*(2021)*

March 2018 - Oct. 2018

Research Intern   📍 Martigny, Switzerland
Idiap Research Institute
Interdisciplinary collaboration with the Municipal Energy Research Center.
◇ Mixed-integer optimization of the energy mix for a holiday resort (approx. 50 decision variables).
◇ Metamodeling by Gaussian Process of the pipeline.
◇ Sensitivity analysis of the system.

June 2017 - Aug. 2017

Engineering Intern   📍 Drancy, France
ELM Leblanc
◇ Study on data integration in energy systems.
◇ Contribution to the development of a CIFRE thesis topic

🎓 EDUCATION

Nov. 2018 - May 2023

Ph.D. in Statistics   📍 Bern, Switzerland
University of Bern
"Modelling and predicting distribution-valued fields with applications to inversion under uncertainty" with Prof. Ginsbourger.
Latin honors **summa cum laude** (equivalent to jury honours).

Sept. 2017 - Oct. 2018

Master of Applied Mathematics   📍 Paris, France
Université Paris Dauphine
Major in *Statistical and Financial Engineering*, statistics track.
Graduated with **High Honors**, as **class valedictorian**.

Sept. 2015 - Sept. 2018

Master of Engineering   📍 Saint-Etienne, France
École des Mines de Saint-Etienne
Major in Statistics and Data Science
Ranked in the **top 10%** of students in these specialties.

Sept. 2013 - Jul. 2015

Preparatory Classes MPSI/MP   📍 Paris, France
Lycée Henri IV

📖 PUBLICATIONS

Conférence	**On the Usage of Gaussian Process for Efficient Data Valuation**, C. Bénesse, P. Mésana, <u>A.G.</u>, S. Gambs.. *Submitted for review in Feb. 2024*
Thesis	**Modelling and predicting distribution-valued fields with applications to inversion under uncertainty**, <u>A.G.</u>. *Accepted by the Faculty of Sciences in May 2023*
Journal	**Continuous logistic Gaussian random measure fields for spatial distributional modelling**, <u>A.G.</u>, D. Ginsbourger. *Submitted for review in Sept. 2023*
Proceedings	**Goal-oriented adaptive sampling under random field modelling of response probability distributions**, <u>A.G.</u>, D. Ginsbourger and G. Pirot. *Published in ESAIM: Proceedings and Surveys.*
Workshop	**Probabilistic ABC with Spatial Logistic Gaussian Process**, <u>A.G.</u>, D. Ginsbourger and G. Pirot. *Published in Third Workshop on Machine Learning and the Physical Sciences, NeurIPS 2020.*

✎ WORK IN PROGRESS (coming soon)

R Package	**SLGP: implementing spatially dependent density estimation in R**, <u>A.G.</u>.
Journal	**SLGP: implementing spatially dependent density estimation in R**, <u>A.G.</u>.

💬 SELECTED TALKS

A complete list is available on my website.

Apr. 2022	**Seminar talk**,	Cornell University, USA.
	Center of Applied Mathematics; and Operations Research and Information Engineering group	
Apr. 2022	**Minisymposium talk, and minisymposium co-organiser**,	Atlanta, USA.
	SIAM UQ 2022: Speaker in minisymposium Statistical Surrogate Modeling and Optimization for Stochastic Simulation; *co-organiser of* Incorporating Structural Information in Kernel Methods.	
Feb. 2022	**Oral presentation**,	London, United Kingdom.
	The Alan Turing Institute	
Oct. 2021	**Seminar talk**,	Trondheim, Norway.
	Department of Mathematical Sciences, Norwegian University of Science and Technology	
Sept. 2021	**Seminar talk (in statistics and optimisation)**,	Toulouse, France.
	Institut de Mathématiques de Toulouse	

★ AWARDS AND GRANTS

- **Best student oral presentation**: GdR MASCOT-NUM annual meeting.   *2022*
- **Maximum grant**: University of Bern, Fund for the Promotion of Young Researchers.   *2022*
- **Student Travel Award:** SIAM Conference on Uncertainty Quantificationm   *2022*
- **Best student poster**: GdR MASCOT-NUM annual meeting   *2021*
- **Louis Neltner Excellence Scholarship** awarded by the foundation of the Ecole des Mines de Saint-Etienne.   *2016*
- **Excellence scholarship** awarded by Fondation Odon Vallet on the basis of good academic results.   *2014*
- **Merit scholarship** awarded by the French State on the basis of excellent results in the Baccalauréat.   *2013-2015*

📖 ACADEMIC SERVICES

Active member of the organization committees of the events:

- **Lifting Inference with Kernel Embeddings 2023** (webmaster)   *June 26-30 2023*
- **Current frontiers in Gaussian Processes** (main organizer)   *Aug. 24-26, 2022*
- **Workshop Unibern-IMT Toulouse** (main organizer)   *May 03-04, 2022*
- **Lifting Inference with Kernel Embeddings 2022** (webmaster)   *Jan. 10-14, 2022*

Academic peer review for the following structures:

- **Artificial Intelligence and Statistics (AISTATS)**   *in 2022 and 2023*
- **Workshop: Machine Learning and the Physical Sciences at NeurIPS**   *in 2021 and 2022*
- **Workshop: Synergy of Scientific and Machine Learning Modeling at ICML**   *in 2023*

👥 COMMUNITY SERVICES

- Member of: SIAM, Statistical society of Canada, Swiss statistical society, GDR MascotNum.
- Managed and curated the ISMV's library at University of Bern, ensuring access to the latest journal issues. (2022-2023)
- Participation to events that promote young researchers (and obtained maximum grant to organize an event)